part of an illumination optical system comprised of a plurality of optical elements (including optical integrators etc.) to a frame supported by a plurality of shock-absorbing pads, optically adjusting the illumination optical system and projection optical system, connecting wiring and tubing to the reticle stage (2) or wafer stage (sample table 5 and XY stage 6 etc.) comprised of the large number of mechanical parts and their drive systems (linear motor etc.), arranging the reference mark member (12 or 46) or photoelectric detector (56) etc. at the wafer stage, and further performing overall adjustment (electrical adjustment, confirmation of operation, etc.) Note that the exposure apparatus is desirably manufactured in a clean room controlled in temperature and cleanness etc.

The semiconductor device is produced through a step of design of the functions and performance of the circuit, a step of fabrication of a working reticle by the exposure apparatus of FIG. 2 using the above master reticle based on the design step, a step of transferring a pattern of a working reticle on a wafer using an exposure apparatus of FIG. 5, a step of assembly of the device (including dicing, bonding, packaging, etc.), and an inspection step.

As the light source, various ones other than the ones illustrated above may be used. For example, it is also possible to use an infrared region or visible region single wavelength laser light emitted from a DFB semiconductor laser or fiber laser amplified by for example an erbium (or both erbium and yttrium) doped fiber amplifier and use the harmonic obtained by converting the wavelength to ultraviolet light using a nonlinear optical crystal.

For example, if the oscillation wavelength of the single wavelength laser is made a range of 1.51 to 1.59 μm, an 8th harmonic of an oscillation wavelength in the range of 189 to 199 nm or a 10th harmonic of an oscillation wavelength in the range of 151 to 159 nm is output. In particular, if the oscillation wavelength is made one in the range of 1.544 to 1.553 μm, ultraviolet light of an 8th harmonic in the range of 193 to 194 nm, that is, a wavelength substantially the same as that of an ArF excimer laser, is obtained. If the oscillation wavelength is made one in the range of 1.57 to 1.58 μm, ultraviolet light of a 10th harmonic in the range of 157 to 158 nm, that is, a wavelength substantially the same as that of an F_2 laser, is obtained.

Further, if the oscillation wavelength is made one

in the range of 1.03 to 1.12 μm, a 7th harmonic of an oscillation wavelength in the range of 147 to 160 nm is output. In particular, if the oscillation wavelength is made one in the range of 1.099 to 1.106 μm, ultraviolet light of a 7th harmonic in the range of 157 to 158 nm, that is, a wavelength substantially the same as that of an F_2 laser, is obtained. Note that as the single wavelength oscillation laser, a yttrium-doped fiber laser is used.

All of the content of the disclosure of Japanese Patent Application No. 10-98373 filed on March 26, 1998, Japanese Patent Application No. 10-103767 filed on March 31, 1998, and Japanese Patent Application No. 10-146586 filed on May 12, 1998, including the specification, claims, drawings, and abstract, are incorporated here by reference in its entirety.